

REMARKS

I. Summary of the Office Action

Claims 1-31 were pending in this patent application.

All pending claims were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter of the claimed invention.

Claims 1-10, 14, 30, and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Radelinow U.S. Patent No. 6,977,534* (hereinafter "Radelinow").

Claims 1 and 30 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over DeClue et al. U.S. Patent No. 6,281,715 (hereinafter "DeClue").

The Examiner indicated that claims 15-29 contained allowable subject matter.

II. Summary of Applicants' Reply

Applicants note with appreciation the indication of allowable subject matter in claims 15-29.

Applicants have cancelled claims 2-4 without prejudice. In addition, applicants have amended claims 1, 5-7, 10, 12-15, and 29-31 to more particularly define the subject matter of the claimed invention. The amendments are fully supported and justified by the application as originally filed and as such, do not introduce new matter. Applicants believe that these amendments do not limit the scope of the claimed invention.

* The Office Action inadvertently listed the patent number as "US 6,9977,534," which does not exist.

The Examiner's rejections are respectfully traversed. Applicants respectfully request that the rejections be withdrawn.

III. The § 112 Rejection

The Examiner rejected claims 1-31 under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter of the claimed invention. This rejection is respectfully traversed.

The Examiner requested clarification of "baud period", "period," and "series of voltage levels" as used in applicants' claims 1, 10, 14, 15, 30, and 31 (see Office Action, page 2). Applicants have amended these claims to clarify those terms. For the Examiner's reference, applicants' FIG. 8 provides illustrative circuitry that may be used to decrease the magnitude of the voltage level of an output signal via a series of voltage levels, and applicants' FIG. 7 shows such a series of voltage levels.

The Examiner also contends that "the sum" in claims 6 and 7 lacks clear antecedent basis. Applicants have amended these claims to correct the antecedent basis.

The Examiner stated that in claim 14, "it is unclear how the reducing can be 'repeated'" (see Office Action, page 3). Applicants have amended claim 14 to remove the language in question. For the Examiner's reference, applicants' FIG. 7 shows repeated reductions to the pre-emphasis voltage amplitude levels 706 of output signal 708.

Regarding claim 29, the Examiner stated that it is unclear if the "signal" on line 1 is the same as the "signal" on line 12. Applicants have amended claim 29 to correct the antecedent basis of these terms.

The Examiner also contends that in claim 30, "'the means for decreasing' is not connected to anything" (see Office Action, page 3). Applicants respectfully disagree. Claim 30 specifies that the "means for decreasing" operates on the magnitude of the output signal from the "means for outputting." Therefore, the "means for decreasing" is clearly connected to at least one other feature (i.e., the means for outputting) of claim 30.

Finally, regarding claim 31, the Examiner contends that "the 'means for reducing,' [and] the 'means for repeating' are not connected to anything" (see Office Action, page 3). Applicants have amended claim 31 to remove the "means for repeating" language. In addition, applicants respectfully submit that the "means for reducing" operates on the output signal from the "means for generating." Therefore, contrary to the Examiner's contention, the "means for reducing" is connected to at least one other feature (i.e., the means for generating) of claim 31.

In view of the foregoing, applicants respectfully submit that claims 1 and 5-31 distinctly claim the subject matter which applicants regard as the claimed invention. Accordingly, applicants respectfully request that the Examiner's rejection under § 112 be withdrawn.

IV. The § 103(a) Rejections

Claims 1-10, 14, 30, and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Radelinow. Claims 1 and 30 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over DeClue. These rejection are respectfully traversed.

A. Independent Claims 1 and 30

Amended independent claims 1 and 30 refer to a method and system for pre-emphasizing an output signal in response to receiving an input signal with a baud period undergoing a voltage transition to an input voltage level. The output signal is outputted at a first voltage level greater in magnitude than the input voltage level for a first period of time less than the baud period. The magnitude of the output signal is then decreased to at least one subsequent voltage level, each subsequent voltage level remaining substantially constant for a subsequent period of time less than the baud period and being smaller in magnitude than the immediately prior voltage level and greater in magnitude than the input voltage level.

The Examiner concedes that neither Radelinow nor DeClue teaches or suggests outputting the output signal "at a first period of time less than a baud period," as specified in applicants' independent claims 1 and 30 (see Office Action, page 4, lines 13-14; and page 5, lines 9-10). The Examiner contends, however, that "selecting the time period as claimed is considered to be a matter of design expedient for an engineer" (Office Action, page 4). Applicants respectfully disagree.

The Examiner is of the opinion that the predetermined baud rate of a system would motivate one of ordinary skill in the art and without knowledge of applicants' disclosure to output a signal at a pre-emphasis voltage level for less than the baud period, as taught by applicants (see Office Action, page 4 and page 5). Applicants respectfully disagree. As noted in applicants' specification, "known pre-emphasis circuitries typically amplify a data signal at a constant amplitude level for the full duration of a baud period" (see page 2, lines 24-26).

Radelinow and DeClue apply the same pre-emphasis current for the full duration of a bit signal (see Radelinow, FIG. 4 and DeClue, column 6). Applicants' claimed approach improves upon known pre-emphasis circuits by, for example, reducing their power consumption and jitter in the output signals while improving fidelity of transmitted signals (see page 2, line 24 to page 3, line 5; and page 8, lines 20-26).

Furthermore, contrary to the Examiner's contention, neither Radelinow nor DeClue teaches or suggests decreasing the magnitude of the output signal to at least one subsequent voltage level, each subsequent voltage level being smaller in magnitude than the immediately prior voltage level and greater in magnitude than the input voltage level, as specified in applicants' independent claims 1 and 30.

Regarding Radelinow, the pre-emphasis current level for the output signal of a given bit is determined by comparing the bit with its immediately preceding bit (see Radelinow, Abstract). Depending on the comparison, additional current may be added to or subtracted from a predetermined current level to pre-emphasize the signal (see Radelinow, Abstract). Radelinow fails to teach or suggest that the current level determined by this comparison changes during the switching transition. Therefore, Radelinow cannot teach or suggest outputting the output signal (for that bit) at a first voltage level for a first period of time that is less than the baud period and decreasing the magnitude of the output signal to at least one subsequent voltage level, as specified in applicants' independent claims 1 and 30.

DeClue also fails to teach or suggest this feature for similar reasons. More specifically, referring to FIG. 2 in DeClue, transistors M25-M28 work in concert to supply additional current ID2 which provides pre-emphasis to LVDS driver 200 (see DeClue, column 7, lines 4-19). DeClue fails

to teach or suggest that the current level of additional current ID2 changes during a switching transition. Therefore, DeClue also fails to teach or suggest outputting the output signal at a first voltage level for a first period of time that is less than the baud period and decreasing the magnitude of the output signal to at least one subsequent voltage level, as specified in applicants' independent claims 1 and 30.

For at least the foregoing reasons, applicants respectfully submit that independent claims 1 and 30 are allowable over both Radelinow and DeClue. Applicants also respectfully submit that dependent claims 5-9, which depend from independent claim 1, are allowable for at least the same reasons as independent claim 1.

B. Independent Claim 10

The Examiner rejected independent claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Radelinow. Applicants respectfully disagree.

As explained above in support of independent claim 1, Radelinow fails to teach or suggest that the current level that provides pre-emphasis for the output signal changes during the switching transition of the output signal. Therefore, Radelinow cannot teach or suggest at least: 1) sinking a first amount of current to reduce a first voltage level to a second voltage level after a first period of time less than a baud period, and 2) sinking a second amount of current after a second period of time less than a baud period concurrently with the first sinking to reduce the second voltage level to a third voltage level, as specified in applicants' independent claim 10.

For at least the foregoing reasons, applicants respectfully submit that independent claim 10 is allowable

over Radelinow. Applicants also respectfully submit that dependent claims 11-13, which depend from independent claim 10, are allowable for at least the same reasons as independent claim 10.

C. Independent Claims 14 and 31

The Examiner rejected independent claims 14 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Radelinow. Applicants respectfully disagree.

Independent claims 14 and 31 refer generally to a method and system for pre-emphasizing an output signal in response to receiving an input signal with a baud period undergoing a voltage transition to an input voltage level. The output signal is generated at a first voltage amplitude that is greater in amplitude than the input voltage level for a first period of time less than a the baud period. The output signal voltage amplitude is then reduced to at least one subsequent voltage level between the first voltage amplitude and the input voltage amplitude. The output signal is further reduced to approximately the input voltage amplitude after reducing the output signal to the at least one subsequent voltage level.

Applicants respectfully submit that independent claims 14 and 31 are allowable over Radelinow for at least similar reasons as those provided in support of independent claim 1. Namely, that Radelinow fails to teach or suggest at least reducing the output signal voltage amplitude to at least one subsequent voltage level between a first voltage amplitude and an input voltage amplitude, as specified in applicants' independent claims 14 and 31.

For at least the foregoing reason, applicants respectfully submit that independent claims 14 and 31 are allowable over Radelinow.

V. Allowable Subject Matter


The Examiner indicated that "claims 15-29 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. § 112, 2nd paragraph," set forth in the Office Action (see Office Action, page 5).

Applicants established in Section III above that claims 1 and 5-31 distinctly claim the subject matter that applicants regard as the claimed invention. Accordingly, claims 15-29 are in condition for allowance.

VI. Conclusion

In view of the foregoing, claims 1 and 5-31 are in condition for allowance. Reconsideration and allowance of this application are accordingly respectfully requested.

Respectfully submitted,



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